Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings of claims in the application:

What is claimed is:

1. (Currently Amended) A system for improving the performance of a distance-type protective relay for power systems, wherein the relay includes a calculation circuit responsive to voltage and current values from the power line to produce a quantity analogous to the distance between the relay and a fault on the power line, wherein the quantity is applied to a distance element for comparison of said quantity with a setting reach value for a selected zone of protection, the system comprising:

a filter circuit responsive to said quantity for filtering said quantity before the quantity is applied to the distance element, resulting in ~~the smoothing~~ noise attenuation of the quantity; and

a control circuit for controlling the application of the filtered quantity to the distance element such that the filtered quantity is applied only when said quantity is above a preselected first threshold value and below a preselected second threshold value.

2. (Previously Presented) The system of claim 1, wherein the preselected first threshold value is a selected percentage of the setting reach value.

3. (Currently Amended) The system of claim 2, wherein the selected

percentage ~~in~~ is 100% minus ~~the~~ an error of the system plus 5% for the relay.

4. (Canceled).

5. (Currently Amended) The system of claim 2, wherein the selected [[5]] percentage is approximately 92%.

6. (Currently Amended) The system of claim 1, wherein said quantity is a high value, significantly higher than said setting reach value, when there is no fault on the power line, and wherein the system includes a circuit for pre-charging the filter to ~~a second selected~~ the preselected second threshold value when said quantity decreases to ~~a selected~~ the preselected second threshold value from said high value, in response to a fault.

7. (Currently Amended) The system of claim [[4]]1, wherein the preselected second threshold value is approximately four times the setting reach value.

8. (New) An apparatus for selecting between one of a first distance value and a second distance value provided to a distance element of a protective relay providing protection for a transmission line of a power system, the protective relay including a calculation circuit adapted to provide the first distance value indicative of a distance between the protective relay and a fault, and a filter adapted to filter the first distance value to form the second distance value, the apparatus comprising:

a first comparator including an output determined by a first input configured to receive the first distance value and a second input configured to receive a first percentage of a zone reach value, the first percentage of the zone reach value greater than the zone reach value;

a second comparator including an output determined by a first input adapted to receive the first distance value and a second input adapted to receive a second percentage of the zone reach value, the second percentage of the zone reach value less than the zone reach value;

an AND-gate including a first input coupled to the output of the first comparator, a second inverting input coupled to the output of the second comparator and an output; and

an OR-gate including a first inverting input coupled to the output of the AND-gate, a second input coupled to the output of the second comparator and an output.

9. (New) The apparatus of claim 8; wherein the first distance value is provided to the distance element upon an occurrence of a binary low value for the output of the AND-gate and a binary high value for the output of the OR-gate, and wherein the second distance value is provided to the distance element upon an occurrence of a binary high value for the output of the AND-gate and a binary low value for the output of the OR-gate.

10. (New) The apparatus of claim 8, wherein the filter is charged immediately after the first distance value is equal to or less than the first percentage

of the zone reach value, the first distance value equaling the first percentage of the preselected setting indicating an occurrence of a fault in the transmission line.

11. (New) The apparatus of claim 8, wherein filter operation is defined by $ms_k = 0.6*m_k + 0.4*ms_{k-1}$, and wherein ms_{k-1} is equal to the first percentage of the zone reach value and m_k is equal to a present value of the first distance value upon a transition of the output of the OR-gate from a binary low value to a binary high value.

12. (New) The apparatus of claim 8, wherein the first distance value comprises an analog m value and the second distance value comprises a filtered analog m value, the filter providing noise attenuation of analog m value.

13. (New)The apparatus of claim 8, wherein the zone reach value is based on a faulted state of the power system.

14. (New) A method for selecting between one of a first distance value and a second distance value provided to a distance element of a protective relay providing protection for a transmission line of a power system, the protective relay including a calculation circuit adapted to provide the first distance value indicative of a distance between the protective relay and a fault, and a filter adapted to filter the first distance value to form the second distance value, the method comprising:

comparing the first distance value to a first percentage of a zone reach value to form a first binary output, the first percentage of the zone reach value

greater than the zone reach value, the zone reach value;

comparing the first distance value to a second percentage of the zone reach value to form a second binary output, the second percentage of the zone reach value less than the zone reach value;

providing the first distance value to the distance element when the first binary output comprises a low binary value or when the second binary output comprises a high binary value; and

providing the second distance value to the distance element when the first binary output comprises a high binary value and the second binary output comprises a low binary value.

15. (New) The method of claim 14, wherein the first binary output has a binary high value when the first percentage of the zone reach value is greater than the first distance value, and has a binary low value when the first percentage of the zone reach value is less than the first distance value, and wherein the second binary output has a binary high value when the second percentage of the zone reach value is greater than the first distance value, and has a binary low value when the second percentage of the zone reach value is less than the first distance value.

16. (New) The method of claim 14, wherein the filter is charged immediately after the first distance value is equal to or less than the first percentage of the zone reach value, the first distance value equaling the first percentage of the preselected setting indicating an occurrence of a

fault in the transmission line.

17. (New) The method of claim 14, wherein filter operation is defined by $ms_k = 0.6*m_k + 0.4*ms_{k-1}$, and wherein ms_{k-1} is equal to the first percentage of the zone reach value and m_k is equal to a present value of the first distance value upon a transition from the first distance value greater than the first percentage of the zone reach value to the first distance value less than the first percentage of the zone reach value.

18. (New) The method of claim 14, wherein the first distance value comprises an analog m value and the second distance value comprises a filtered analog m value, the filter providing noise attenuation of analog m value.

19. (New) The method of claim 14, wherein the zone reach value is based on a faulted state of the power system.